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REMARKS

The foregoing amendments are made to more thoroughly define the subject matter Applicant regards as his invention. Support for the limitations added to claim 1 regarding the fact that the cleaning composition is not an eye irritant and the subsequent removal of the contaminant can be found in the specification at page 8, lines 8 and 15-19. Support for the limitations in new claims 33-43 regarding the particular esters recited in these claims can be found in the specification at page 4, lines 1-2.

Applicant respectfully traverses the various prior art rejections insofar as they apply to the claims as amended. An important feature of the present invention is that the cleaning compositions used in the inventive process are strong enough to remove most contaminants commonly found in the home environment, including dried latex paint as well as uncured organic solvent based paints, while at the same time being substantially benign (or at least not particularly detrimental) from an environmental and health standpoint. Although the cited references show many organic chemicals being used in many different industrial processes, they do not show or suggest processes in which common **household organic contaminants** are easily removed with essentially benign organic solvents.

Thus, the Roelofs patent does indeed show removing paint from paint fluid delivery system using cleaning compositions which may include a wide variety of different organic solvents, including some of the organic solvents used in the cleaning compositions of the present invention. However, an essential feature of the Roelof's cleaning compositions is that they also contain abrasive particles. Col. 3, line 15 and col. 5, line 12. Therefore, this patent does not disclose or suggest a process in which a cleaning composition which is **not classified as an eye irritant** under 16 CFR 1500.42 and which **consists essentially of** the indicated cleaning members, as now recited in claim 1, is used to remove an organic contaminant from a surface.[1]

As stated by the Federal Circuit in AK Steel Corporation v. Sollac et al., (No. 03-1074,-1075,-1085,-1086)(Fed. Cir. 9/23/03) (citing PPG Indus. v. Guardian Indus. Corp., 156 F.3d 1351, 1354 (Fed. Cir. 1998) and In re Janakirama-Rao, 317 F.2d 951, 954 (CCPA 1963)) "consisting essentially of" in a patent claim permits inclusion of components not listed in the

[1] Applicant has not specifically tested the Roelofs compositions according to the eye irritant test of 16 CFR 1500.42, but presumes they would not pass this test because of they contain significant amounts of abrasive particles.

claim, provided that they do not "materially affect the basic and novel properties of the invention."

In this case, Roelof's abrasive particles would clearly cause eye irritation and hence would exert a material adverse effect on the cleaning compositions of the present invention. Thus, these ingredients are excluded from the scope of Applicant's claims. That being the case, the Roelofs Patent does not disclose or suggest the subject matter of these claims, since cleaning with abrasive particles is a critical feature of the Roelofs technology.

In this connection, Applicant notes that the "organic solvents, surfactants, acids, and alkali materials that are suitable for the [patented] abrasive cleaner compositions" can also be used to pretreat the fluid handling systems being cleaned in the Roelofs patent. *See*, col. 7, lines 36-38. However, such pretreating must be followed by treatment with the patented cleaning compositions, which necessarily contain abrasive particles, as indicated above. Accordingly, this patent does not disclose or suggest a cleaning process in which the contaminant is removed by

(i) the flow of the cleaning composition itself,

(ii) the evaporation of the cleaning composition itself,

(iii) wiping the surface, and/or

(iv) washing the surface with a composition **consisting of** a liquid,

as also expressly recited in claim 1. Mannesmann Demag Corp v. Engineered Metal Products Co., 793 F.2d 1279, 230 U.S.P.Q. 45 (Fed. Cir. 1986). ("Consisting of" is a special term in patent law meaning that the claim is "closed to the inclusion of materials other than those recited except for impurities ordinarily associated therewith.")

The newly cited Volk patent teaches that a composition containing an organic ester (specifically, a C_1-C_4 dialkyl ester of a C_4-C_6 aliphatic dibasic acid) and at least 40 wt.% N-methyl-2-pyrrolidone or analog can be used to remove paint. Similarly, the Gaul patent teaches that a composition containing an organic ester (specifically, dimethyl and diethyl esters of adipic, glutaric and succinic acids) and at least 10 wt.% of γ-butyrolactone can be used to remove paint. However, as can be seen from the attached MSDS's, both of these additional compounds, i.e., both N-methyl-2-pyrrolidone and γ-butyrolactone, are eye irritants. Moreover, N-methyl-2-pyrrolidone has an MIR of 2.79, as can be seen from the attached table of MIR values. Therefore, these patents also fail to disclose or suggest the inventive process in which an organic

component is removed from a surface using a cleaning composition which is **not classified as an eye irritant** under 16 CFR 1500.42 and which **consists essentially of** the indicated cleaning members, as now recited in claim 1.[2]

The additionally cited Wilkins patent also fails to disclose or suggest the present invention. Although this patent does show that various types of paints including polyurethanes and epoxies can be removed with cleaning compositions containing organic esters, a critical feature of the Wilkins cleaning compositions is that they contain a significant amount of a peroxide. If they do not, they fail for their intended purpose. *See*, Example E of the Wilkins patent which shows no removal when peroxide is absent. Accordingly, this patent also fails to disclose or suggest removing a common household organic component from a surface using a cleaning composition which is **not classified as an eye irritant** under 16 CFR 1500.42 and which **consists essentially of** the indicated cleaning members, as now recited in claim 1.[3]

In this connection, it is important to note that the inventive process is directed primarily to removing dried latex paint and other common household organic contaminants (including **uncured** organic solvent based paints), as described at the bottom of page 2 of the specification and expressly recited in claims 2 and 27. It is not directed to removing more tenacious organic coatings such as those commonly found in many industrial applications and described in most of the references cited against the claims. For example, it is not directed to removing the polyurethane and epoxy/polyimide coatings of Example 2E of the Wilkins patent. Thus, Example 2E of the Wilkins patent does not anticipate or suggest the inventive process as now claimed, since no removal occurred of an organic coating which is more tenacious than the organic contaminants being claimed.

Finally, Applicant again respectfully traverses the anticipation rejection based on the Yezrielev patent, insofar as it applies to the claims as amended. The gist of the disclosure at col. 6, lines 5-7 is that the fluid and fluid blends of this patent can be used to wholly or partially replace previously-used liquids **in every process known to man**. Moreover, the Yezrielev patent is clear that "[f]luid applications are broad, varied, and complex, and each application has its own set of characteristics and requirements." *See*, col. 1, lines 22-25.

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[2] The N-methyl-2-pyrrolidone and γ-butyrolactone of Volk and Gaul have also not been specifically tested by Applicant according to 16 CFR 1500.42.

[3] Wilkins's cleaning compositions have also not been specifically tested by Applicant according to 16 CFR 1500.42.

Thus, to achieve the present invention from the disclosure of this patent, one of ordinary skill in the art[4] would not only have to select the particular cleaning ingredients recited in Applicant's claims from the rather long list of possibilites set forth in col. 13, lines 5 to 36 but also choose the particular application recited in Applicant's claims (i.e., removing an organic contaminant from a surface) from the almost infinite number of possibilities also set out in the specification of this patent. Moreover, this would have to be done without any suggestion from this patent regarding which particular organic solvents should be used for cleaning processes in general and for cleaning organic contaminants such as dried latex paints in particular.

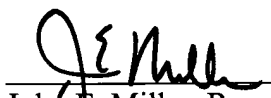
As indicated in the previous Amendment, the Federal Circuit has made clear that:

> ". . . rejections under 35 USC 102 are proper only when the claimed subject matter *is* identically disclosed or described in "the prior art." Thus, for the instant rejection under 35 USC 102. . .to have been proper, the Flynn reference must clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without *any* need for picking, choosing and combining various disclosures not directly related to each other by the teachings of the cited reference." (emphasis added) In re Arkley et al., 455 F.2d 586, 172 USPQ 524 (CCPA 1972)

Here, the total possible combinations of organic solvents on the one hand and processes for using such solvents on the other hand are almost endless. Moreover, there is simply no disclosure fairly associating particular solvents described in this patent with particular processes described in this patent, at least insofar as Applicant's claims are concerned. Therefore, this patent simply fails **identically describe** the subject matter recited in the claims now in the case in the sense of the Arkley case.

If any additional fees are due with this Amendment, please charge our Deposit Account No. 03-0172.

Respectfully submitted,



John E. Miller, Reg. No. 26,206
(216)622-8679

[4] Which particular art this might be is completely unknown, since just about every field of technology known to man which uses a liquid in any way for any purpose appears to be covered by this disclosure.

REPORT NUMBER: 971 VAN WATERS & ROGERS INC. PAGE: 001
MSDS NO: P2466 MATERIAL SAFETY DATA SHEET
EFFECTIVE DATE: 10/25/90 VERSION: 010

M-Pyrol

PRODUCT: N-METHYLPYRROLIDONE

ORDER NO:
PROD NO :

VAN WATERS & ROGERS INC. , SUBSIDIARY OF UNIVAR (206)889-3400
6100 CARILLON POINT , KIRKLAND , WA 98033

---------- EMERGENCY ASSISTANCE ----------

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC
(800)424-9300

---------- FOR PRODUCT AND SALES INFORMATION ----------

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE AT
VW&R CLEVELAND 216-425-4330 TWINSBURG , OH

----------PRODUCT IDENTIFICATION----------

PRODUCT NAME: N-METHYLPYRROLIDONE CAS NO.: 872-50-4

COMMON NAMES/SYNONYMS: M-PYROL N-METHYLPYRROLIDONE; NMP; N-METHYL 2 PYRROLIDONE ELECTRONIC GRADE MSDS #: P2466

FORMULA: C5 H9 N O DATE ISSUED: 10/90

MOLECULAR WEIGHT: 99.1 SUPERCEDES: 04/90

HAZARD RATING (MANUFACTURER) HMIS RATING

HEALTH: 2
FIRE: 2
REACTIVITY: 0
SPECIAL: NONE

HAZARD RATING SCALE
0=MINIMAL 3=SERIOUS
1=SLIGHT 4=SEVERE
2=MODERATE

HMIS RATING
HEALTH: 2
FIRE: 2
REACTIVITY: 0

----------HAZARDOUS INGREDIENTS----------

COMPONENT	%	EXPOSURE LIMITS, PPM OSHA PEL	ACGIH TLV	OTHER LIMIT	HAZARD

M-PYROL

REPORT NUMBER: 971 VAN WATERS & ROGERS INC. PAGE: 002
DS NO: P2466 MATERIAL SAFETY DATA SHEET
EFFECTIVE DATE: 10/26/90 VERSION: 010

PRODUCT: N-METHYLPYRROLIDONE

ORDER NO:
PROD NO :

N-METHYLPYRROLIDONE	>99	NONE	NONE	100 (BASF)	COMBUSTIBLE

----------PHYSICAL PROPERTIES----------

BOILING POINT, DEG F: 395

MELTING POINT, DEG F: N/A

SPECIFIC GRAVITY (WATER=1): 1.027

VAPOR PRESSURE, MM HG: <1 pH: 7.7-8.0 (100 G/L WATER)

VAPOR DENSITY (AIR=1): 3.4 WATER SOLUBILITY %: 100

EVAPORATION RATE (BUTYL ACETATE = 1): <1

VOLATILE (BY VOLUME): 100

APPEARANCE AND ODOR: CLEAR, COLORLESS LIQUID; SLIGHT AMINE ODOR.

----------FIRST AID MEASURES----------

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF SKIN CONTACT: IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

IF SWALLOWED: IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING BY GIVING 2 GLASSES OF WATER AND STICKING A FINGER DOWN THE THROAT. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

NOTES TO PHYSICIAN: NONE

----------HEALTH HAZARD INFORMATION----------

PRIMARY ROUTES OF EXPOSURE: SKIN OR EYE CONTACT

SIGNS AND SYMPTOMS OF EXPOSURE

N-PYROL

REPORT NUMBER: 971
MSDS NO: P2466
EFFECTIVE DATE: 10/26/90

VAN WATERS & ROGERS INC.
MATERIAL SAFETY DATA SHEET

PAGE: 003
VERSION: 010

PRODUCT: N-METHYLPYRROLIDONE

CAS # 872-50-4

ORDER NO:
PROD NO :

INHALATION: PROLONGED OR REPEATED EXPOSURE OR BREATHING VERY HIGH CONCENTRATIONS MAY CAUSE HEADACHES, NAUSEA, AND VOMITING.

EYE CONTACT: VAPORS WILL IRRITATE THE EYES. LIQUID AND MISTS WILL IRRITATE AND MAY CAUSE TEMPORARY CORNEAL CLOUDING.

SKIN CONTACT: BRIEF CONTACT MAY DRY THE SKIN. PROLONGED OR REPEATED CONTACT MAY IRRITATE THE SKIN, CAUSING DERMATITIS.

SWALLOWED: INGESTION OF LARGE AMOUNTS MAY CAUSE GASTRIC DISTURBANCES.

CHRONIC EFFECTS OF EXPOSURE: NO SPECIFIC INFORMATION AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE KNOWN.

----------TOXICITY DATA----------

ORAL: RAT LD50 = 3,600 MG/KG

DERMAL: RABBIT LD50 = 8,000 MG/KG

INHALATION: NO DEATHS AFTER 8 HOURS EXPOSURE TO SATURATED VAPORS.

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OTHER DATA: CONTACT WITH THE LIQUID RESULTS IN EYE IRRITATION AND MAY CAUSE TEMPORARY CORNEAL CLOUDING. PROLONGED SKIN CONTACT CAUSES IRRITATION, REDNESS AND DEFATTING. INGESTION OF LARGE AMOUNTS MAY CAUSE GASTRIC DISTURBANCES. IN ANIMAL STUDIES IN RATS AND MICE, NMP WAS EMBRYOTOXIC BY THE ORAL AND INTRAPERITONEAL ROUTES AT VERY HIGH DOSE LEVELS WHICH WERE CLOSE TO THE LD50.

IN A DERMAL EXPOSURE STUDY WITH RATS, NMP WAS ONLY EMBRYOTOXIC AT THE HIGH DOSE LEVEL; THIS EFFECT WAS ATTRIBUTED TO MATERNAL TOXICITY. SEVERAL INHALATION STUDIES IN RATS DID NOT REVEAL ANY INDICATION OF MATERNAL TOXICITY OR EMBRYOTOXICITY. IN A TWO YEAR INHALATION STUDY, NMP DID NOT CAUSE ANY LIFE-SHORTENING OR CARCINOGENIC EFFECTS IN RATS AT 0.04 OR 0.4 MG/LITER (10 AND 100 PPM RESPECTIVELY).

----------ECOLOGICAL INFORMATION SECTION----------

ATIC TOXICITY:

BLUE GILLS (LEPOMIS MACROCHIRUS) LC50 - 832 MG/L

MATERIAL SAFETY DATA SHEET LS-502

GAMMA BUTYROLACTONE

MSDS No P000677-1-OSHA-AE
MSDS CLASS H
Ver. No 1
Ver. Date NOV 3 93

ARCO Chemical Company
3801 West Chester Pike
Newtown Square
PA 19073 USA

IMPORTANT : Read this MSDS before handling and disposing of this product and pass this information on to the employees, customers, and users of this product. This product is covered by the OSHA Hazard Communication Rule and this document has been prepared in accord with the MSDS requirements of this rule.

1. General

Trade Name	GAMMA BUTYROLACTONE	Telephone Numbers :	
Other ACC Names	GBL	EMERGENCY	
Synonyms	None	800/424-9300	CHEMTREC
		610/359-8300	ARCO CHEM
		CUSTOMER SERVICE	
		800/321-7000	INFO ONLY
Other Industry Names	Dihydro-2(3H)-Furanone; Gamma Hydroxy Butyric Acid Lactone; 4-Butyrolactone		
Chemical Family	Lactones	DOT Hazardous Materials Proper Shipping Name: Not regulated	
Generic Name	Gamma Butyrolactone	DOT Hazard Class: Not regulated	DOT Reportable Quantity: N/AP
CAS No. (See Section 9 - Components)		ACC Material ID BE268	UN/NA ID No. N/AP

2. Summary of Hazards

Signal Word	WARNING
Physical Hazards	Slightly combustible liquid
Acute Health Effects (Short-Term)	Moderate inhalation hazard Severe eye irritant Slight ingestion hazard No skin irritation hazard identified from data available Slight skin absorption hazard (See Section 4 - Health Hazards)
Chronic Health Effects (Long-Term)	Gamma-butyrolactone was not carcinogenic in rats or mice by oral, subcutaneous injection, or dermal administration, nor was this material teratogenic in limited tests in rats (See Section 4 - Health Hazards - Summary of Chronic Hazards)

3. Fire and Explosion

Flash Point AP 209 °F (SETA)	Autoignition Temperature AP 820 °F	Flammable Limits (at Normal Atmospheric Temp and Pressure) Lower: AP 3.6 (% vol in air) Upper: AP 16 (% vol in air)

Fire and Explosion Hazards	Heat from fire can generate flammable vapor. When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined. Vapors may be heavier than air. May travel long distances along ground before igniting/flashing back to vapor source. Fine sprays/mists may be combustible at temperatures below normal flash point.
Extinguishing Media	CO2 Dry chemical Foam Water spray Water fog
Extinguishing Media Use Comment	No additional information available
Special Firefighting Procedures	Do not enter fire area without proper protection. (See Section 12 - Hazardous Decomposition Products). Fight fire from a safe distance/protected location. Heat may build pressure/rupture closed containers, spreading fire, increasing risk of burns/injuries. Do not use solid water stream/may spread fire. Use water spray/fog for cooling. Avoid frothing/steam explosion. Burning liquid will float on water. Notify authorities if liquid enters sewer/public waters.

4. Health Hazards

Summary of Acute Hazards	High health hazard - see below for route-specific details.

ROUTE OF EXPOSURE	SIGNS AND SYMPTOMS	PRIMARY ROUTE(S)
Inhalation	No appropriate human or animal health effects data are known to exist.	Yes
Eye Contact	May cause severe eye irritation.	Yes
Skin Absorption	Extensive/prolonged or repeated exposure to this material can result in significant absorption.	Yes
Skin Irritation	No significant signs or symptoms indicative of any adverse health hazard are expected to occur as a result of skin exposure.	No
Ingestion	This material may be a slight health hazard if ingested in large quantities.	No

Summary of Chronic Hazards	Gamma-butyrolactone was not carcinogenic in rats or mice by oral, subcutaneous injection, or dermal administration, nor was the material teratogenic in limited tests in rats. (See Section 11 - Additional Toxicological Information).
Special Health Effects	This material or its emissions may aggravate pre-existing eye disease.

5. Protective Equipment and Other Control Measures

Respiratory	No occupational exposure standards have been developed for this material. Where exposure through inhalation may occur from use, NIOSH/MSHA approved respiratory protection equipment is recommended.
Eye	Eye protection, including both chemical splash goggles and face shield, must be worn when possibility exists for eye contact due to splashing/spraying liquid, airborne particles, or vapor. Contact lenses must not be worn.
Skin	Depending on the conditions of use, protective gloves, apron, boots, head and face protection should be worn. The equipment must be cleaned thoroughly after each use.
Engineering Controls	At elevated temperatures, special ventilation may be required even if the flash point has not been exceeded. Flammable mists or aerosols can be generated below the flash point of high boiling liquids.
Other Hygienic Practices	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
Other Work Practices	Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing/wash thoroughly before reuse. Shower after work using plenty of soap and water.

6. Occupational Exposure Limits

Substance	Source	Date	Type	Value/Units	Time	Skin
No established standards						

Industrial Hygiene Comments	No additional Occupational Exposure Limit information available

7. Emergency and First Aid

Inhalation	If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain emergency medical attention. Prompt action is essential.
Eye Contact	In case of eye contact, immediately rinse with clean water for 20-30 minutes. Retract eyelids often. Obtain emergency medical attention.
Skin Contact	Remove contaminated clothing as needed. Wash skin thoroughly with mild soap and water. Flush with lukewarm water for 15 minutes. If sticky, use waterless cleaner first.
Ingestion	If large quantity swallowed, give lukewarm water (pint) if victim completely conscious/alert. Do not induce vomiting/aspiration if risk of damage to lungs exceeds poisoning risk. Obtain emergency medical attention.
Emergency Medical Treatment Procedures	Induce vomiting with syrup of ipecac if patient is awake/alert. Treat symptomatically. Gastric lavage indicated for complete emptying.
Detoxification Procedures	Following gastric emptying either by induced vomiting or gastric lavage, administer an aqueous slurry of activated charcoal followed by a cathartic.

GAMMA BUTYROLACTONE

MSDS No P000677-1-OSHA-AE
Ver. Date NOV 3 93

8. Spill and Disposal

Precautions if Material is Spilled or Released
May contaminate water supplies/pollute public waters. Evacuate/limit access. Equip responders with proper protection (See Section 5 - Protective Equipment). Prevent flow to sewers/public waters. Stop release. Notify fire and environmental authorities. Restrict water use for cleanup. Slippery walking. Spread granular cover. Impound/recover large land spill. Soak up small spill with inert solids. Use suitable disposal containers. On water, material soluble/may float or sink. May biodegrade. Contain/minimize dispersion/collect. Disperse residue to reduce aquatic harm. Report per regulatory requirements.

Waste Disposal Methods
Contaminated product/soil/water may be RCRA/OSHA hazardous waste due to potential for eye irritation/water pollution. (See 40 CFR 261 and 29 CFR 1910). Landfill solids at permitted sites. Use registered transporters. Burn concentrated liquids in systems compatible with water soluble wastes. Avoid flameouts. Assure emissions comply with applicable regulations. Dilute/aqueous waste may biodegrade. Avoid overloading/poisoning plant biomass. Assure effluent complies with applicable regulations.

9. Components

(This may not be a complete list of components.) (Compositions are typical values, not specifications.)

Component Name	CAS No.	Composition Amount (Wt.)		Carcinogen ###
Gamma-Butyrolactone	96-48-0	GT 98	%	N/P

1 = National Toxicology Program 2 = International Agency for Research on Cancer 3 = Occupational Health and Safety Administration 4 = Other

10. Component Health Hazards

Component	Component Health Hazards (See Section 11 - Addt'l Tox Info.)
Gamma-Butyrolactone	

11. Additional Toxicological Information

Component Name/Comments

Gamma-Butyrolactone
Overexposure to Gamma-Butyrolactone is expected to cause symptoms of Central Nervous System (CNS) depression. In experimental animals (dosed orally or by injection) changes in levels of neurotransmitters have been reported. Behavioral changes in these experimental animals consistent with changes in neurotransmitter levels were noted in these studies.

Material
No additional toxicology information is available for this material.

12. Physical and Chemical Data

Boiling Point AP 400 °F	Viscosity AP 2 CPS (at 68° F) (Brookfield)	Dry Point N/AP
Freezing Point AP -46 °F	Vapor Pressure AP 1.5 MM HG (at 68° F)	Volatile Characteristics Slight
Specific Gravity AP 1.12 (H_2O = 1.0 at 39.2° F)	Vapor Specific Gravity GT 3 (Air = 1.0 at 60-90° F)	Solubility in Water Miscible
pH AP 7 to 8	Hazardous Polymerization Not expected to occur	Stability Stable

Other Chemical Reactivity	No additional information available
Other Physical and Chemical Properties	No additional information available
Appearance and Odor	Clear, colorless; Liquid; Little or no odor
Conditions to Avoid	Heat, sparks, open flame, other ignition sources, and oxidizing conditions

12. Physical and Chemical Data (Cont'd)

Materials to Avoid	Strong acids, Strong bases, Strong oxidizing agents
Hazardous Decomposition Products	Incomplete combustion may produce carbon monoxide and other toxic gases

13. Hazards Rating Information

National Fire Protection Association
No hazards rating information is available for this system

National Paint and Coatings Association

Hazardous Materials Information System (HMIS)
No hazards rating information is available for this system

14. Additional Precautions

Handling and Storage Procedures
Store in tightly closed/properly vented containers. Store away from heat, sparks, open flame and strong oxidizing agents.

Decontamination Procedures
Equipment containing this material should be isolated and thoroughly drained, washed and purged prior to maintenance/repair operations. Wear recommended personal protective equipment.

GAMMA BUTYROLACTONE

MSDS No P000677-1-OSHA-AE
Ver. Date NOV 3 93

15. Regulatory Information

FEDERAL:

Toxic Substance Control Act (TSCA)
The following is the TSCA Chemical Substance Inventory Status of the components of this material with CAS numbers listed in Section 9 - Components:

CHEMICAL	CAS NO.	STATUS
Gamma-Butyrolactone	96-48-0	1. Listed - Non Confidential

Superfund Amendments and Reauthorization Act of 1988 (SARA), Title III

- Section 302/304

Requires emergency planning based on "Threshold Planning Quantities" (TPQs), and release reporting based on Reportable Quantities (RQs) of "Extremely Hazardous Substances" (EHS) listed in Appendix A of 40 CFR 355. There are no components of this material with known CAS numbers which are on the EHS list.

- Section 311 & 312
Based upon available information, this material and/or components are not classified as any of the specific health and/or physical hazards defined by Section 311 & 312.

- Section 313

The material does not contain any chemical components with known CAS numbers that exceed the De Minimis reporting levels established by SARA Title III, Section 313 and 40 CFR 372.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

No chemicals in this material with known CAS numbers are subject to the reporting requirements of CERCLA.

OSHA Regulations
"Chemical-specific" OSHA regulations presented under 29 CFR 1910 do not apply to this material or its components.

Other EPA Regulations
No additional information is available.

Department of Transportation (DOT)
Other than the normal shipping instructions and information given in this MSDS, there are no other specific DOT regulations governing the shipment of this material.

STATE REGULATIONS:

California Safe Drinking Water and Toxic Enforcement Act of 1988 - Proposition 65

This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins under California Proposition 65 at levels which would be subject to the proposition.

California South Coast Air Quality Management District (SCAQMD) Rule 443.1 (VOC's)
A Volatile Organic Compound (VOC) is any volatile compound of carbon excluding methane, carbon monoxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, 1,1,1-trichloroethane, methylene chloride, (FC-23), (CFC-113), (CFC-12), (CFC-11), (CFC-22), (CFC-114), and (CFC-115). By this definition, this is a VOC material.

Massachusetts Right-to-Know Substance List (MSL) [105 CMR670.000]

Extraordinarily Hazardous Substances (MSL-EHS) must be identified when present in materials at levels greater than state specified criterion. The criterion is >= 0.0001%. Hazardous Substances (MSL-HS) on the MSL must be identified when present in materials at greater than the state specified criterion. The criterion is >= 1%. Components with CAS numbers present in this material, at levels specified in Section 9 - Components, do not require reporting under the statute.

New Jersey Registration
The New Jersey, Registry 3, Registration law does not apply to this material, as none of its components are trade secrets.

15. Regulatory Information (Cont'd)

Pennsylvania Right-to-Know Hazardous Substances Lists
Special Hazardous Substances (PA-SHS) must be identified when present in materials at levels greater than the state specified criterion. The criterion is >= 0.01%. Hazardous Substances (PA-HS) must be identified when present in materials at levels greater than the state specified criterion. The criterion is >= 1%. Environmental Hazards (PA-EH) must be identified when present in materials at levels greater than the state specified criterion. The criterion is >= 0.01%. Components with CAS numbers present in this material, at levels specified in Section 9 - Components, do not require reporting under the statute.

Regulatory Advisory
If you reformulate or further process this material, you should consider re-evaluation of the regulatory status of the components listed in Section 9, based on the final composition of your product.

GAMMA BUTYROLACTONE

MSDS No P000677-1-OSHA-AE
Ver. Date NOV 3 93

16. Label Information

Manufacturer:
ARCO Chemical Company
3801 West Chester Pike
Newtown Square
PA 19073 USA

Telephone Numbers :
EMERGENCY
800/424-9300 CHEMTREC
610/359-8300 ARCO CHEM
CUSTOMER SERVICE
800/321-7000 INFO ONLY

Other ACC Names: GBL

Signal Word: WARNING

Use Statement:
For industrial use only
Keep out of reach of children

Physical Hazards
Combustible

Health Hazards
Ingestion hazard
Inhalation hazard
Skin contact hazard
Severe eye irritant
May cause long-term adverse health effects

Precautionary Measures
Do not handle near heat, sparks, or open flame
Do not store near combustible materials
Avoid contact with eyes
Avoid prolonged or repeated breathing of gases, vapors, or mists
Avoid prolonged or repeated contact with skin
Use only with adequate ventilation/personal protection
Prevent contact with food, chewing, or smoking materials
Wash thoroughly after handling
Do not take internally
Keep container closed when not in use

DOT Information: UN/NA ID No. N/AP DOT Hazard Class: Not regulated DOT Reportable Quantity: N/AP

DOT Hazardous Materials Proper Shipping Name: Not regulated

Component Name	CAS No.	Composition Amount (Wt.)		RQ
Gamma-Butyrolactone	96-48-0	GT 98	%	N/AP

Instructions: In case of fire, use: CO2; Dry chemical; Foam; Water spray; Water fog

First Aid
- Inhalation: If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain emergency medical attention. Prompt action is essential.
- Eye Contact: In case of eye contact, immediately rinse with clean water for 20-30 minutes. Retract eyelids often. Obtain emergency medical attention.
- Skin Contact: Remove contaminated clothing as needed. Wash skin thoroughly with mild soap and water. Flush with lukewarm water for 15 minutes. If sticky, use waterless cleaner first.
- Ingestion: If large quantity swallowed, give lukewarm water (pint) if victim completely conscious/alert. Do not induce vomiting/aspiration if risk of damage to lungs exceeds poisoning risk. Obtain emergency medical attention.

In case of spill: May contaminate water supplies/pollute public waters. Slippery walking/spread granular cover. On water, may biodegrade. Contain/minimize dispersion/collect. Report per regulatory requirements.

Protective Equipment
- Respiratory: Where excessive vapor, mist, or dust exposure may result from use, use NIOSH/MSHA approved respiratory protection equipment.
- Eye: Both chemical splash goggles and face shield must be worn.
- Skin: Clothing such as gloves, apron, sleeves, boots, and full head/face protection appropriate to conditions of use should be worn.

Label No.: LP000677 Version No.: 1 Date: SEP 1 93

17. General Comments

General Comments
No additional information available.

Other Comments
Some of the information presented and conclusions drawn herein are from sources other than direct test data on the material itself.

Note Qualifications:			
	EQ=Equal	AP=Approximately	N/P=No applicable information found
	LT=Less Than	UK=Unknown	N/AP=Not applicable
	GT=Greater Than	TR=Trace	N/DA=No Data Available

Disclaimer of Liability

The information in the MSDS was obtained from sources which we believe are reliable.
HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, REGARDING ITS CORRECTNESS.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge.
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This MSDS was prepared and is to be used only for this product.
If the product is used as a component in another product, this MSDS information may not be applicable.

Print Date

January 13, 1994

Table 1. Summary of "Best Estimate", "Upper Limit" and "Uncertainty Adjusted" MIR Values as of 8/6/98.

Compound or Mixture	"Best Est" MIR			Upper Limit MIR				U.Adj.	Rate Constants (cm^3 $molec^{-1}$ s^{-1})								
	Unc	MR	IR (g/g)	KR	MR Tp.	MR Max	IR (g/g)	MIR (g/g)	Adj. Eff. kOH	kOH Value	kOH Ref.	kOH Note	kO3 Value	kO3 Ref.	kO3 Note	kNO3 Value	kNO3 Ref.	kNO3 Note
Alkyl Phenols	5	6	2.42	1.00	NP	32	14.20	2.42	9.8e-11	4.2e-11	2					1.4e-11	2	
Alkyl Phenols	5	6	2.42		LM		14.20	2.42										
Alkyl Phenols	5	6	2.42		LM		14.20	2.42										
Alkyl Phenols	5	6	2.42		NP	32		2.42										
Nitrobenzene	11	7	0.07	0.03	U			0.15	1.5e-13	1.5e-13	2,39							
Toluene Diisocyanate	-				U													
Ethyl Amine	11	11	10.56	1.00	NP	12	12.73	12.73	2.8e-11	2.8e-11	69							
Dimethyl Amine	11	13	12.16	1.00	NP	12	12.24	12.24	6.6e-11	6.6e-11	69							
Trimethyl Amine	11	12	9.56	1.00	NP	18	14.62	14.62	6.1e-11	6.1e-11	69							
Methyl Nitrite	3				P													
Ethanolamine	-				P													
Diethanol Amine	-				P													
Triethanolamine	-				P													
Acrylonitrile	-				U													
N-Methyl-2-Pyrrolidone	5	6	2.79	0.99	U			2.79	2.2e-11	2.2e-11	20					1.3e-13	20	
Methyl Chloride (explicit)	-				NP	6												
Methyl Chloride	-				NP	6												
Dichloromethane	-			0.03	NP	6	0.10	0.10	1.4e-13	1.4e-13	2							
Methyl Bromide	-			0.01	NP	6	0.02	0.02	3.9e-14	3.9e-14	2							
Chloroform	-				NP	6												
Carbon Tetrachloride					LM													
Methylene Bromide	-				NP	6												
Vinyl Chloride	-				NP	12												
Ethyl Chloride	-				NP	12												
Trans-1,2-Dichloroethene	-				NP	12												
1,1-Dichloroethene	-				NP	12												
1,1-Dichloroethane	-				NP	12												
Ethylene Dichloride	-				NP	12												
Ethyl Bromide	-				NP	12												
1,1,2-Trichloroethane	-				NP	12												
1,1,1-Trichloroethane	-			0.02	NP	12	0.09	0.09	1.0e-13	1.0e-13	2							
Perchloroethylene	-			0.03	NP	12	0.12	0.12	1.7e-13	1.7e-13	2							
Ethylene Dibromide	-				NP	12												
1,2-Dichloropropane	-				NP	18												
n-Propyl Bromide	6				NP	18												
1-Chlorobutane	-				NP	24												
n-Butyl Bromide	6				NP	24												